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ABOUT PARALLEL COMPUTERS

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ABSTRACT: In this paper was represented parallel computers. The problems in parallel computing

KEYWORDS: Parallel Competing, Parallel Methods

INTRODUCTION

Parallel computer is the important direction in the filde of Parallel Competing. We know two types of parallel computers: vector and matrix computers. Zhe known specialists in the field of parallel computing are Kuck D. (USA), D. Ortega (USA), Muraoka (Japon), Schedukhin S.G.(Novosibirsk, Russion), Mirenkov N.N.(Russian, Novosibirsk), Voevodich K. (Moskow, Russian), Nepomnyschaja A.S. (Novosibirsk, Russian), Valkovsky V. (Moscow, Russian), Kutepov V.P. (Moscow, Russian), Zhangissina G.D. (Almaty, Kazakstan) and ofher spicialists. For solving scientific – technical tasks it is need know the next important knowledges:

- Parallel computers,
- Parallel languages and algorithms,
- Parallel methods,
- Parallel systems.

PARALLEL COMPUTERS

At present we know parallel computers has two types:

- Vector computers,
- Matrix computers.

Parallel computer: Gray-1, CYBER, STAR and other computers.

Vector computers (Figure 1) for P processors has the next type:

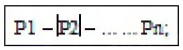

Figure 1

where Pi – Processor (i= i,…,n)

MATRIX COMPUTER

Matrix Computer has the Next Type

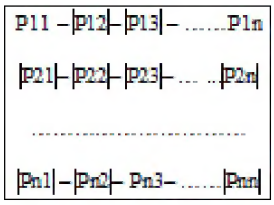

Figure 2

Pij –processor (i, j = 1,…, n)

For example: computer STAR (8x8) has 64 processors:

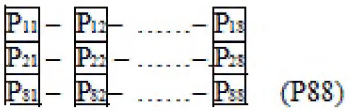

Figure 3

PARALLEL LANGUAGES

Parallelism

Parallel computing two and more processes.

Parallel programming – design programes, including parallel sections. Functional languigies: ALfl, ParALfl, APL have such date structures, as lists and functional missives. Missives are constructed by help mka (d,t) operations. In result computing this expression are constructed vector from d values (i=1,…d).

For example:

{result squares(0);

Squares (n) = n*n^ squares(n+1)}.

APL Languages includes three functional forms, named outer product, reduction and inner product.

OCCAM language can to write as parallel acts, which working in any computers such acts, which are working on one computer. The task of multiple matrix A and B has the next type:

PROCMUL (CHAN up, down, left, right)

VAR c, a, b:

SEQ c:=0

SEQ I=[0 FOR n-1]

SEQ

PAR

up? b

left? a

c:=c+axb

PAR

down! b

right! a

Parallel computer uses for solving one task few processors. If we have for one processor for task solving time- t, then p processors can to solve this task on time- t/p.

PARALLEL METHODS

Comparison Algorithm

Algorithm has the next type:

```
text Loc=Length(pattern)
pattern Loc=length(pattern)
 while (text Loc<= Iength (text)) and (pattern Loc>0) do
 if text[text Loc]=pattern[pattern Loc] then
 text Loc= textLoc-1
 pattern Loc=patternLoc-1
 else
text Loc=text Loc + MAX(slide[text[text Loc]], jump[pattern Loc])
pattern Loc=length(pattern)
end if
end while
```

Search List Maximal Element

If we have p=N/2 processors then we have the next algorithm:

```
count=N/2
for i=l to log (count)+ ldo
    Parallel Start
       for j=l to count do
            P[j] читает M [2j] в x и M[2j+1] в Y
            If X>Y
            P[j] пишет X в M[j]
            else
```

end tor j

Parallel End count=count/2 end for i

If parallel computing will be have the good results, then must exist other method then sequantial. If we want, that full cost may be order O(N), and time computing parallel algorithm – order O(log N), then number must be order O(N / log N). This means that on first step every processor must be production N / (N / log N) = log N values.

In the result we go to next algorithm:

Parallel Start

for j = 1 to N/log N do

P[*j*] находит максимум значений ячеек с *M*[1 + (*j* – 1) * log *N*]

до *M*[*j* * log *N*] последовательным алгоритмом

P[*j*] записывает найденный максимум в *M*[*j*]

end for

Parallel End

count=(N/log N)/2

for i=l to log (count)+l

Parallel Start

for j=l to count do

P[j] читает M[2j] в X и M[2j+1] в Y

If X >Y

P[j] пишет X в M[j]

else

P[j] пишет Y в M[j]

end if

end for j

Parallel End

count=count/2

end for i

PARALLEL SYSTEMS

For solving complex tasks we have many parallel systems: OCCAM system, PFOR, Glypnir, Actus, parallel Cobol, OVS-ALGOL, OVS-Fortran, PA (I) languages.

CONCLUSIONS

In this paper we represented parallel computers, parallel algorithms and parallel languages. Parallel computers and parallel methods are the good instruments for solving many complex tasks, for example Security Information in Government, for Protection Kazakhstan Information, for parallel representation information in President Administration.

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